REMARKS

By this amendment, claims 1-3 have been cancelled, and claims 4-7 have been added. Thus, claims 4-7 are now active in the application. Reexamination and reconsideration of the application are respectfully requested.

In the final Office Action mailed May 11, 2009, claims 1-3 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sirven (U.S. 4,749,068) in view of Chan (U.S. 2002/0171223) and Wyman (U.S. 3,062,331); and claims 1-3 were further rejected under 35 U.S.C. 103(a) as being unpatentable by Tanaka (U.S. 2004/0087398) in view of JP 5-10849 and Tanaka 2 (JP 2000-266144). These rejections are respectfully traversed and are, in any event, believed clearly inapplicable to the claims as now presented, for the following reasons.

With exemplary reference to the present drawing figures, independent claim 4 sets forth an auto-tensioner A for engine accessories, comprising: a cylinder 11 having an open top end; a sleeve 12 having a bottom and inserted in the cylinder 11; a seal member 13 mounted to the cylinder 11 at the open top end thereof to prevent leakage of hydraulic oil in the cylinder 11; a rod 16 slidably extending through the seal member 13; a plunger 24 connected to a bottom end of the rod 16 so as to be slidable in the sleeve 12 along an axial direction, the plunger 24 defining a pressure chamber 25 below the plunger 24 in the cylinder 11, and the plunger 24 defining a reservoir chamber 26 above the plunger 24 in the cylinder 11 such that, with hydraulic oil (see Fig. 2) present in the reservoir chamber 26, an air gap 14 is present in the reservoir chamber 26 between the hydraulic oil and the seal member 13, the plunger 24 having a passage 27 through which the pressure chamber 25 communicates with the reservoir chamber 26; a check valve 28 provided at the passage 27 to close the passage 27 when a pressure in the pressure chamber 25 exceeds a pressure in the reservoir chamber 26; and a return spring 21 mounted around the cylinder 11 to bias the rod 16 outwardly of the cylinder; wherein a minute oil leak gap 35 (see replacement Fig. 4 filed November 19, 2008) is formed between sliding surfaces of the sleeve 12 and the plunger 24 such that hydraulic oil can flow from the pressure chamber 25 into the reservoir chamber 26 via the minute oil leak gap 35, the minute oil leak gap 35 having a cross-sectional area, in a cross section perpendicular to the axial direction, substantially smaller than a cross-sectional area, in a cross section perpendicular to the axial direction, of the passage 27; wherein a return chamber 29 is defined under the sleeve 12 so as to communicate with the reservoir chamber 26, the bottom of the sleeve 12 being formed with a valve hole 31 through

which the return chamber 29 communicates with the pressure chamber 25; and wherein a relief valve 32 is provided at the valve hole 31 to open the valve hole 31 if the pressure in the pressure chamber 25 exceeds a set pressure.

Thus, new independent claim 4 is similar to previous claim 1 except that a few minor modifications have been made to the claim language to improve the clarity of the structures defined thereby, and except that claim 4 now specifies that: (1) the reservoir chamber 26 is defined above the plunger 24 in the cylinder 11 "such that, with hydraulic oil present in said reservoir chamber, an air gap [14] is present in said reservoir chamber between the hydraulic oil and said seal member"; and (2) the minute oil leak gap 35 has a cross-sectional area, in a cross section perpendicular to the axial direction, substantially smaller than a cross-sectional area, in a cross section perpendicular to the axial direction, of the passage 27, as clearly illustrated in Figs. 2 and 4.

First, regarding the rejection based on the Sirven, Chan and Wyman references, according to the Examiner, the Sirven patent discloses a cylinder (8), a sleeve (combination of 2 and 7), a seal member (5, 5a) a plunger, a rod (3), a reservoir chamber (2b), a pressure chamber (2a), and a check valve (27).

As pointed out by the Examiner, the passage 26 of Sirven corresponds to the claimed "passage" in that the Sirven passage 26 opens when the pressure in the alleged pressure chamber 2a of Sirven is lower than the pressure in the alleged reservoir chamber 2b of Sirven (due to the presence of the "check valve" 27 in Sirven). Likewise, the passage 28 of Sirven corresponds to the claimed "oil leak gap" because, when the pressure in the pressure chamber 2a of Sirven is higher than the pressure in the reservoir chamber 2b of Sirven, hydraulic oil flows through the passage 28 (due to the presence of the valve 29). It is noted, as a significant point, that the Sirven reference is directed to a shock absorber. As such, it is important that the rod 3 is able to protrude at a sufficiently slow speed to provide the needed damping characteristics so as to absorb shock. Therefore, as clearly illustrated in the Sirven patent, the passage 26 (which corresponds to the claimed "passage") has a cross-sectional area that is substantially equal to the cross-sectional area of the passage 28 (which corresponds to the claimed oil leak gap). Therefore, even if somehow it would have been obvious to modify Sirven to include a "minute oil leak gap" (as shown in the annotated figure on page 4 of the May 11, 2009 Office Action) present between the plunger 14 and sleeve 12 of the Wyman patent, the "minute oil leak gap"

would not have met the limitation of present claim 4 requiring the minute oil leak gap to have a cross-sectional area substantially smaller than a cross-sectional area of the passage.

Even more importantly, however, it must be recognized that, in the Sirven patent, the passages 26 and 28 are provided in order to accurately control the flow of hydraulic oil therethrough, to thereby accurately control the protruding and retracting speeds of the rod 3, in cooperation with the check valves 27, 29. If the alleged "minute oil leak gap" of Wyman was provided between the sliding surfaces of the piston 1 and the cylinder 2 of the Sirven patent, it would become totally impossible to control the flow the hydraulic oil therethrough and, accordingly, the protruding and retracting speeds of the rod 3 would not be accurately controlled, since the Wyman "minute oil leak gap" has no check valve. It is further noted that the "minute oil leak gap" of Wyman is quite large (Fig. 1) and is also not uniform in the axial direction, as can be seen comparing Figs. 1 and 2 of Wyman.

Furthermore, as mentioned above, the claim language has been slightly revised to clarify structural features of the invention, although it is submitted that these features were already apparent from previous claim 1. Specifically, reference is made to the claim 4 limitations that the pressure chamber is defined below the plunger in the cylinder, and the reservoir chamber is defined above the plunger in the cylinder, such that, with hydraulic oil present in the reservoir chamber 26, an air gap 14 is present in the reservoir chamber 26 between the hydraulic oil and the seal member 13 (as illustrated in Fig. 2). It is further noted in the same regard that the seal member 13 is defined as being mounted to the cylinder 11 at the open top end thereof. Thus, the orientation of the presently claimed auto-tensioner is important to obtain the desired functionality by defining the pressure chamber 25 below the plunger 24 and the reservoir chamber 26 above the plunger 24 such that, with the hydraulic oil present in the reservoir chamber 26, the air gap 14 is present in the reservoir chamber 26 between the hydraulic oil and the seal member 13. In the Sirven device, the seal member 5, 5a is provided at the bottom end of the cylinder 8, the reservoir chamber 2b is provided below the plunger 1, and the pressure chamber 2a is provided above the plunger 1. This particular orientation of the Sirven device is very clear when considering the overall function of the Sirven device and, in particular, when considering the disclosure in the Sirven patent that "the reservoir 11 encloses in its top part a gas 16, the level of the liquid being indicated by 17" (see column 4, lines 65-65 of Sirven).

Therefore, for the reasons presented above, as well as for the reasons presented in the "Request for Reconsideration" filed August 11, 2009, it is believed apparent that a person having ordinary skill in the art would not have found it obvious to modify the Sirven patent in view of Wyman and Chan in such a manner as to result in or otherwise render obvious the present invention even as recited in previous claim 1 and, especially, as now recited in independent claim 4. Therefore, it is respectfully submitted that claim 4, as well as claims 5-7 which depend therefrom, are clearly allowable over the Sirven, Chan and Wyman references.

Next, turning to the rejection based upon the Tanaka, JP 5-10849 and Tanaka2 references, this rejection is also respectfully traversed and, it is further submitted that this rejection is clearly inapplicable to new claim 4, for the following reasons.

As mentioned above, claim 4 is similar to previous claim 1, except that some of the claim language has been slightly revised to improve clarity with respect to certain claim structure, and to add the above-mentioned two additional limitations: (1) regarding the "air gap" 14; and (2) regarding the substantially smaller cross-sectional area of the minute oil leak gap width 35 with respect to the cross-sectional area of the passage 27.

In the Tanaka reference (U.S. 2004/0087398), according to the Examiner, the tensioner 10 includes a cylinder 20, a seal member 23, a rod 12, a plunger 13, a sleeve 11, a reservoir chamber 24, a pressure chamber 16, a passage 51, a check valve 52, a return chamber 41c, a valve hole 42, and a relief valve 44. Recognizing that Tanaka does not teach "wherein a minute oil leak gap is formed between sliding surfaces of said sleeve and said plunger ...", the Examiner indicates, in the rejection, that "Tanaka2" (JP 2000-266144) "teaches a minute oil gap (14) (Fig. 3, Fig. 4)." The Examiner then concludes that it would have been obvious "to modify the shock absorber in Tanaka with the oil leak gap between the plunger and the sleeve as Tanaka2 to reduce damping for a desired application ...". However, as clearly shown in Fig. 1 of Tanaka, a piston ring 13A is provided between the sliding surfaces of the plunger 13 and the sleeve 11. Clearly, this piston ring 13A is provided to prevent leakage of oil or other fluid between the sliding surfaces. As noted in paragraph [0046] (lines 1-4) of Tanaka, it is desired to prevent air from intruding into the high pressure oil chamber 16 from the gas chamber 24A. Thus, the gas in gas chamber 24A and the hydraulic oil from reservoir chamber 24 are kept separate. Such separation requires that there not be leakage between the sliding surfaces of the plunger 13 and the sleeve 11.

Therefore, in view of this explicit provision of the piston ring 13A to prevent leakage between the sliding surfaces of the plunger 13 and sleeve 11, and in view of a further disclosure in Tanaka that the plunger 12 is itself made to be in slidable contact with the inner periphery of the cylinder 11 (see paragraph [0049]), it is very clear that a person having ordinary skill in the art would not have found it obvious to modify Tanaka by, instead of providing the piston ring 13A, providing a minute oil leak gap such as that disclosed in Tanaka2, since doing so would clearly render the Tanaka device inoperable for its intended purpose.

Furthermore, in Tanaka, the orifice hole 42 serves to allow gas from pressure chamber 16 to exit therefrom upon pressurization of pressure chamber 16 beyond a predetermined pressure, and therefore serves the only function of the claimed oil leak gap that might be considered useful in the Tanaka configuration. However, as discussed above, utilizing the minute oil leak gap of Tanaka2, instead of the orifice hole 42 with relief valve 44 of Tanaka, would be detrimental to the operation of the Tanaka device. As such, it is submitted that a person having ordinary skill in the art for this additional reason would clearly not have found it obvious to utilize the Tanaka2 minute oil leak gap in the configuration of Tanaka.

Therefore, for the reasons presented above, it is respectfully submitted that the present invention even as presented in previous independent claim 1 would not have been obvious to a person of ordinary skill in the art over Tanaka, Tanaka2 and JP 5-10849, and furthermore, that the present invention especially as now set forth in new independent claim 4, would not have been obvious in view of any reasonable combination of Tanaka, Tanaka2 and JP 5-10849 for the reasons presented above. Therefore, it is respectfully submitted that claim 4, as well as claims 5-7 which depend therefrom, are clearly allowable over the prior art of record.

The Examiner's attention is also directed to the new dependent claim 7 which further requires the seal member (e.g., 13) to be interposed radially between the rod (e.g., 16) and the cylinder (e.g., 11) so as to seal a radial gap between the rod 16 and the cylinder 11.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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